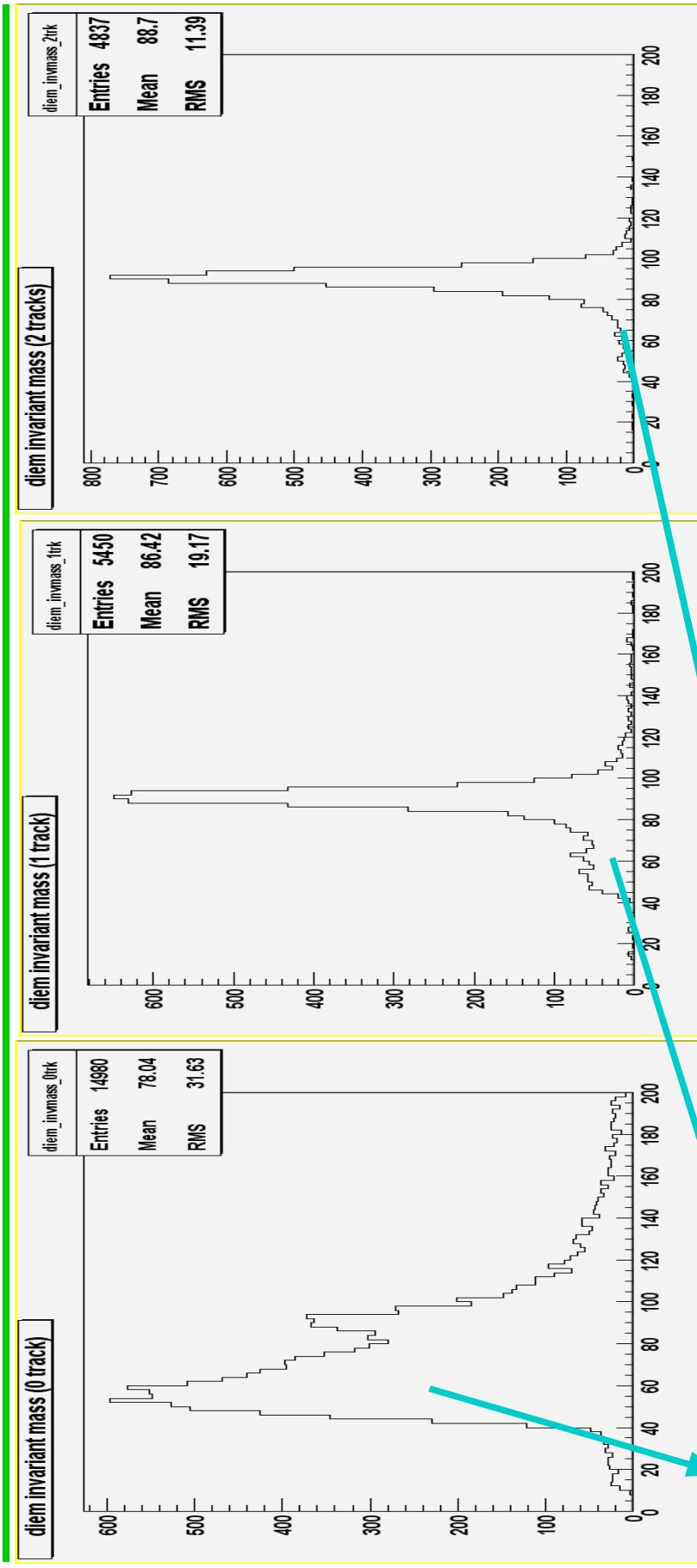


Z($e\mu$) + Jets: Fakerate and QCD background estimation



$$\begin{aligned}
 N_0 &= DY + QCD \\
 N_1 &= 2(\varepsilon - \varepsilon^2)DY + 2(1-f')QCD \\
 N_2 &= \varepsilon^2 DY + f^2 QCD
 \end{aligned}$$

f = ? (fake rate)

$\varepsilon = 0.72$ (track matching/finding)



Sideband and fitting

Sideband: looking at 50-60 GeV and 120-130 GeV sidebands to estimate background in the signal region (80-100 GeV) $f = 8\%$

Fitting: Exponential (B) + Gaussian (S) fitting to estimate background $f = 7.4\%$

Fitting	sample	S	B	B(QCD)	B(DY)	S/SQRT(B _{QCD})
sb	0trk	1119	1923	1734	189	27
sb	1trk(ex)	3368	331	255	76	211
sb	2trk	3949	109	11	98	1191
sb	1trk(inc)	7317	440	266	174	449
fit	0trk	1010	7207	6093	1114	13
fit	1trk(ex)	3399	1284	835	449	118
fit	2trk	4022	611	33	577	700
fit	1trk(inc)	7421	1895	868	1026	252

Selection Criteria

→ **EM:**

- Latest EM candidate
- $|EMF| > .9$
- $|Iso| < 1.5$
- $H_{mX} < 20$
- $P_T > 20 \text{ GeV}$
- Fiducial:
 - $|\eta| < 2.5$
 - $|ICR| = 1.1 < |\eta| < 1.6$
 - No phi cuts
- $80 \text{ GeV} \leq m_{ee} \leq 100 \text{ GeV}$

→ **Jets (JCCB):**

- Jetcor v04-02-03
- $.05 < EM_{frac} < .95$
- $Ch_{frac} < .4$
- $H_{tfrac} < 10.$
- $N_{90} > 1$
- F90 cut
- dR between jet and id'd EMobject $> .45$
- $P_T > 20 \text{ GeV}$
- $|\eta| < 2.5$

